

In-flight connectivity takes off

Live TV on planes and more advanced WiFi-based in-flight entertainment services are the next frontier. How can satellite stand to benefit from these opportunities, asks Goran Nastic

For the first time, this year's football World Cup was available live in mid-air on seven airlines signed up to show a live sports channel on long-haul flights. The action could be viewed free of charge by all passengers, including those in economy.

This is one example of how the advent of broadband connectivity has enabled WiFi effectively into the passenger cabin. That type of connectivity gives new options in terms of live TV specifically and seat-back in-flight entertainment (IFE) in general.

The global IFE segment is worth more than \$3 billion annually. Connectivity is a small part of the IFE market, estimated at 12% of total IFE revenues in 2012, but is set for significant growth by 2020 when it will account for a share of 44%, which explains the interest in

this sector by satellite operators and in-flight service providers.

In-flight connectivity growth is being driven by a combination of falling prices, higher speeds, and expanding capacity and coverage, all of which are pushing connectivity beyond the original North American stronghold.

"The market has momentum now. What we see is around a quarter of the world's fleet of air transport aircraft have already committed to a satellite Ku-band solution. That's being driven by consumer demand and that more passengers are walking on planes with multiple connectable devices," says Intelsat's director of mobility services, James Collett.

These are busy times for sector, with around 60 airlines currently providing passenger in-flight connectivity services via satellite or air-to-ground (ATG) networks. Analysts at NSR Research see

fleet operators.

Thaicom announced in June that it would become the first satellite operator in Asia-Pacific to introduce in-flight broadband using Ku-band, part of the company's 'New Frontiers' campaign which will see it expand its focus to include end-to-end satcom mobility services for air, land, and sea vehicles.

Thailand's low cost airline Nok Air, which last year transported nearly six million passengers, started providing broadband Wi-Fi services on many of its aircraft in August, ranging from internet access to other complimentary services in the future. The Thaicom In-Flight Connectivity (IFC) broadband service was installed together with Global Eagle Entertainment/Row44 as a value added service for Nok Air passengers combining broadband with video content.

Meanwhile, Eutelsat's new high-capacity satellite, 172B, due for launch in 2017 at 172° East, will host the Pacific Ocean Region's first High Throughput payload, delivering an overall throughput of 1.8 Gbps, specifically designed for Ku-band in-flight broadband. Panasonic Avionics Corporation is an early customer, planning to use it for trans-Pacific and Asian in-flight broadband and live TV services provided to commercial airlines under a multi-year agreement.

In Europe, Inmarsat is working on a pan-European network to deliver in-flight connectivity across the region by 2016 when a new satellite is set to launch, with BA one of the first airline customers, starting with its domestic UK routes. Inmarsat has ordered a new S-band satellite, Europasat, and expects to complement this satellite, with a fully integrated air-to-ground network across the EU, offering high speed broadband services to commercial and business aviation passengers. The company said it has received strong support from EU telecoms regulators and claims that a number of European airlines are aligned with this vision.

the recent wave of commercial airline connectivity deals as a prime example of the satellite industry moving into new mobility markets. And this year has been a particularly active one in terms of announcements by the main satellite





Big growth ahead

One trend points to inflight connectivity becoming increasingly integrated with the IFE business, as seen by the recent launch of entertainment products from connectivity providers such as Gogo and OnAir.

Euroconsult report earlier this year forecast over 12,900 commercial and 24,000 business aircraft providing these services to passengers by 2023 (see table).

Satellite is expected to be the main benefactor of this growth, with capacity requirements of more than 40 Gbps of traffic carried over commercial Ku and Ka-band satellites by 2023. About one third of the traffic is expected to be over oceanic regions.

The planned launch of a new generation High Throughput Satellite (HTS) systems, such as Inmarsat Global Xpress, Intelsat Epic, Telesat Vantage, and Eutelsat 172B will provide expanded capabilities compared to traditional satellites.

According to Collett, the Intelsat Epic platform will provide traditional wide beams and Epic spot beams, enabling intelligent use of spectrum that frees more throughput for broadband – as much as 200Mbps per spot beam available to a plane flying through any given beam, with a total throughput per satellite of 25 to 60 Gbps. What Epic will do is overlay on top of that traditional wide beam Ku-band fabric by providing ultra-high throughput capability in the regions that are most

densely trafficked by passenger aircraft.

Collett adds that when the company put together the design of the Epic system - Intelsat has so far announced seven Epic-class satellites - it analysed the routes that commercial airlines fly and found that these are not evenly distributed, there are hotspots in geography so the network was designed to mirror those traffic patterns.

In terms of technology, “there’s a lot of things the network is having to deal with, including specifically Doppler shift that you get at those speeds” and a more sophisticated version of automatic beam switching that is also used in the maritime segment, Collett notes. The combination of these two techniques guarantees seamless hand-off from one beam to the next for consistent quality of service, he says.

Apart from giving passengers in-flight WiFi, live-streaming of TV is the big opportunity, giving airlines the ability to differentiate from competitors by having a broader range of entertainment options for customers.

There’s a group of specialist service providers, including Panasonic Avionics, Gogo and Global Eagle/Row44, that have emerged who are well positioned to service growing demand. They offer international content to hardware customers, as a part of the system package, or by getting into contracts with live-television suppliers, particularly on long-haul flights. Panasonic, the market leader, provides at last count at least seven channels of

Sharks in the sky

After snakes on a plane comes sharks on a plane as Discovery took its long-running Shark Week programme into the air with Southwest Airlines.

Southwest passengers were able to view exclusive content in the shape of a special episode, Jaws Strikes Back, which was shown prior to its television debut.

Customers could access the episode via the in-flight entertainment portal, which delivers free live TV programming to WiFi-equipped personal devices, courtesy of sponsor Dish Network. The service, which reaches more than 100m passengers each year, is provided through in-flight content and connectivity partner Global Eagle Entertainment.

Southwest also added Cartoon Network to its in-flight portal, the first children’s focused channel to feature in its line-up.

high-quality broadcast live TV to aircrafts, pretty much everywhere the aircraft flies.

Business models: up in the air

Despite the hype and a promising future, service providers are still struggling to find a sustainable business model. With even live sports like the World Cup provided as a value-add as opposed to a premium offering, airlines rarely see any profits from this connectivity.

According to Euroconsult, none of the service providers are currently close to being profitable in the connectivity business. Indeed, only 6% of passengers are willing to pay for connectivity services and airlines generally consider connectivity services an improvement to the passenger experience rather than a revenue generation opportunity.

But along with the growth in installation, both the take-up rate and ARPU are expected to improve. As a consequence, total revenue from passenger connectivity services is expected to grow from \$440 million in 2013 to \$2.1 billion by 2023.

Just having connectivity at all might be a suitable differentiator for some airlines while others might want to exploit a captive customer base. Either way, these are early days and the business models remain a point of much debate.

What is clear though is that the skies will very much be the next frontier for broadband connectivity. **CSI**

Number of connected commercial aircraft

	2013	2023	CAGR
North America	2,690	8,000	11%
Europe	220	1,250	19%
Asia-Pacific	80	2,500	40%
Middle East & Africa	290	980	13%
Latin America	38	340	25%

Source: Euroconsult, 2014